

**Environmental Health Sciences
Self-Study Course SS3010**

Lesson 9: *Recreation Areas and Temporary Residences*

Part I: Multiple Choice

1. Improper use of chemicals or improperly balanced pool or beach water may cause the spread of infectious disease due to
 - a. removal of protective coatings of mucous on tissue
 - b. irritation of skin
 - c. living organisms in the water
 - ☒ d. all of the above.

2. Some studies indicate that swimmers have a higher over-all illness rate than do non-swimmers
 - ☒ a. regardless of bathing water quality
 - b. due to poor regulatory practice
 - c. if they are over 50 years of age
 - d. if they swim in pools.

3. Swimming pools receive fecal waste, urine, dead tissue, saliva, mucous from the nose, sweat, and pollution and contaminates from the surrounding environment. This emphasizes the importance of proper swimming pool design including
 - a. recirculation
 - b. filtration and proper disinfection
 - c. proper operation
 - ☒ d. all of the above.

- ☒ The treatment system of a pool should be installed in which of the following flow arrangements?
- a. skimmer or gutter line, main drain line, adjustment valves, disinfectant feeder, hair strainer, pump, filter, pH feeder pump, adjustable inlets
 - b. skimmer or gutter line, main drain line, adjustment valves, hair strainer, pump, filter, pH feeder pump, adjustable inlets
 - ☒ c. skimmer or gutter line, main drain line, adjustment valves, pH feeder pump, hair strainer, pump filter, disinfectant feeder, adjustable inlets
 - d. skimmer or gutter line, main drain line, adjustment valves, hair strainer, disinfectant feeder, filter aid and pH feeder, pump, filters, adjustable inlets.
- ☒ Swimming pool water clarity is measured in terms of
- ☒ a. NTU
 - b. Sacchi readings
 - c. JTU
 - d. Jackson Units.
- ☒ 6. A pool filtration system should filter the entire volume of water every _____.
- ~~a. 2 to 3 hours~~
 - b. 6 to 8 hours
 - c. 10 to 12 hours
 - d. 12 to 24 hours.
7. The rate of filtration should be _____ for a diatomite filter.
- a. 15 to 20 gpm/ft²
 - ☒ b. 3 to 5 gpm/ft²
 - ☒ c. 1 to 2 gpm/ft²
 - ~~d. 3 gpm/ft²~~

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8. Chemicals that have been used for pool disinfection include chlorine, chloro-iso-cyanurates, bromine and
- a. ammonia
 - b. soda ash
 - c. sodium thiosulfate
 - ☒ d. iodine.
9. The gutters or skimmers receive a minimum of _____ of the total pool water due to the large quantity of organisms and materials which typically float.
- a. 95 percent
 - b. 45 percent
 - ☒ c. 60 percent
 - d. 30 percent.
10. The recommended and most effective method of maintaining pool water quality is
- a. super-chlorination
 - b. intermittent circulation, chlorination, and filtration
 - ☒ c. continuous recirculation, chlorination, and filtration
 - d. chlorination - dechlorination.
- ☒ 11. A pH between _____ and _____ is optimal PH control for eye irritation, but is not optimal for chlorine effectiveness.
- a. 7.5 - 7.6
 - b. 7.0 - 7.1
 - c. 7.2 - 7.3
 - ☒ d. 7.9 - 8.0.
- ☒ 12. One advantage of using cyanuric acid additive is that it
- a. allows easier measurement of chlorine
 - ☒ b. prevents pH deterioration
 - c. stabilizes residual chlorine
 - d. requires less soda ash as an additive to the pool.

23. Water in wading pools should be completely recirculated every

- ☒ a. 60 minutes
- b. 90 minutes
- c. 6 hours
- d. 24 hours.

24. An operating free chlorine residual of _____ is usually required in practice.

- a. 0.2 ppm
- ☒ b. 1.0 to 3.0 mg/l
- c. 0.4 to 0.8 mg/l
- d. 2 to 5 ppm.

25. The ideal pH range for swimming pools is

- a. 6.0 to 8.5
- b. 6.5 to 8.5
- ☒ c. 7.2 to 7.6
- d. 5.0 to 7.0

Part II: Multiple Choice

- ☒ Swimming pools have been implicated in many outbreaks of disease, including
- a. rabies
 - b. AIDS
 - ☒ c. taeniasis
 - d. leptospirosis.
2. The generally prohibited swimming facility from a public health perspective is a
- a. home outdoor pool
 - ☒ b. fill and draw pool
 - c. natural flow-through pool
 - d. recirculating pool.
- ☒ It is essential that all public pools
- a. require footbaths
 - ☒ b. require pre-showering of patrons
 - c. run the recirculation and disinfection equipment 24 hours per day
 - d. shovel in at least 4 lbs of calcium hypochlorite per 10,000 gallon per 4-hour period.
4. The water depth should clearly be marked on the pool perimeter for every _____ of depth change
- a. 6 foot
 - b. 5 foot
 - ☒ c. 2 foot
 - d. 1 foot
5. It has been found that pools less than 30 feet wide with a surface area less than 1600 ft²
- ☒ a. may utilize skimmers instead of gutters
 - b. may utilize gutters rather than skimmers
 - c. are not required to have disinfectant feeders
 - d. do not have to use continuous equipment operation.

6. The pool must be designed
- ☒ a. to fit the expected numbers of swimmers
 - b. with oversized filters to meet unexpected peak demands
 - c. with oversized pumps to meet peak demands
 - d. with a variety of filter types to provide filtering options for the operator.
7. Approved public swimming pools should have
- a. a pump that will recirculate the contents of the pool every 6 hours
 - b. a filter that is designed for the output of the recirculation pump
 - c. a disinfection system capable of dosing an outdoor pool at 10 mg/l
 - ☒ d. all of the above.
8. The fresh water supply line to the pool must
- a. have a direct solid connection to the public water line
 - ☒ b. fill to the pool through an approved air gap
 - c. have an approved pump hooked to the public water supply line to suck the water to the pool for fast fills
 - d. none of the above.
9. In large pools with outlets more than 5 feet from the end wall, pool inlets should be located
- a. every 30 feet
 - b. every 10 feet
 - ☒ c. every 20 feet
 - d. every 5 feet.
10. Pool inlets should be located a minimum of 10 inches to 15 inches below the water line to
- ☒ a. ensure good mixing
 - b. prevent clogging
 - c. prevent loss of disinfectant
 - d. ensure mixing of pH additives poured into pool.

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11. The main drain should have a grate that is _____ the area of the discharge pipe to prevent dangerous suction effects.
- ☒ a. four times
 - b. five times
 - c. six times
 - d. two times.
12. The connection between the pool drain and the sanitary sewer must
- a. be solid copper no less than three inch in diameter
 - b. be solid cast iron or NSF approved PVC
 - c. have a properly located cleanout
 - ☒ d. be provided with an air gap no less than 2 pipe diameters of the discharge pipe.
- ~~13.~~ The backwash rate for both conventional, rapid and high rate sand filters is
- a. 5 gpm/ft²
 - ☒ b. 10 gpm/ft²
 - c. 15 gpm/ft²
 - d. 50 gpm/ft².
- ~~14.~~ The minimum recommended depth of water under a 1 meter board (1 meter high) is
- a. 8 feet
 - ☒ b. 9 feet
 - c. 10 feet
 - d. 11 feet.
15. One of the ways to recognize a well designed and properly operated pool is when you find the water at the time of inspection to be
- ☒ a. crystal clear, with the proper level of approved disinfectant, and a PH level of 7.4
 - b. crystal clear, with the proper level of approved disinfectant, and a PH level of 8.4
 - c. crystal clear, with the proper level of approved disinfectant,, and a PH level of 6.8
 - d. crystal clear, with the proper level of approved disinfectant,, and a PH level of 7.0.

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16. The formula $\frac{\text{volume of Pool}}{\text{Pump Flow Rate (GPM)} \times 60 \text{ min.}}$ = turnover rate, will tell us
- ☒ a. the number of hours it takes for the entire contents of the pool to pass through the filters
 - b. the efficiency rate of the pumps
 - c. the gallons per minute flow rate
 - d. the chlorine demand per day.
17. When chlorine is added to water
- ☒ a. one acid is formed
 - ~~b. two acids are formed~~
 - c. HCl is considered the primary product
 - d. ozone is produced in large quantities.
- HOCl - Hypochlorous acid*
18. The molecular state of hypochlorous acid is the desired product from chlorination of pool waters. This product
- a. is increased with an upward movement of pH
 - b. is decreased with a lower of pH
 - c. is ionized with a pH decrease
 - ☒ d. is 62 percent molecular at a pH of 7.2.
19. A pH _____ is probably optimal for minimal eye irritation along with maintenance of effective residual chlorine.
- a. above 7.8
 - b. below 7.2
 - ☒ c. 7.5 to 7.6
 - d. none of the above.
20. Gas chlorine is considered
- a. 50 percent available chlorine
 - b. 75 percent available chlorine
 - ☒ c. 100 percent available chlorine
 - d. 92 percent available chlorine.

21. A vehicle built on a chassis and having a body of not more than 8-feet wide and 32-feet long designed for travel, recreation, and vacation use is
- ☒ a. travel trailer
 - b. all-terrain vehicle
 - c. mobile home
 - d. none of the above.
22. Many of the problems associated with migrant labor camps are related to
- a. infectious and parasitic diseases
 - b. economic exploitation
 - c. poor housing, facilities, and basic sanitation
 - ☒ d. all of the above.
23. One study of basic sanitation and migrant farm workers found that migrants who did not have access to water and sanitation facilities in the field had a clinic utilization rate for diarrhea
- a. 10 times that of rural poor
 - ☒ b. 20 times that of urban poor
 - c. 15 times that of urban poor
 - d. 20 times that of rural poor.
24. The assemblage of large numbers of people in a limited area requires that certain minimum facilities be provided. Some guidelines to assist in the preparation for mass gatherings include
- a. a plan showing area of site and location in relation to towns within 20 miles
 - b. refuse storage and disposal
 - c. noise control
 - ☒ d. all of the above.

25. The preferred method for controlling sewage from watercraft is the use of

- ☒ a. on-board holding tanks
- b. overboard discharge
- c. incinerator toilet
- d. compost toilet.